

at the eastern apex of a subordinate basin formed by transverse folding.

Should further research show that at this point the seams referred to maintain their size, and extend in a form permitting of economic exploitation, the discoveries are of great importance. The search for similar seams may then reasonably be made at other points along the coal band, and certainly the areas of the Minas Basin coal field is large enough to allow a hope that in the future it may be added to the list of our productive districts.

ART. II.—NOTES ON THE MANGANESE ORES OF LOCH LOMOND,
C. B. BY EDWIN GILPIN, A. M., F. G. S., F. R. S. C.,
Inspector of Mines.

(Read 14th Jan., 1884.)

FOR a number of years the presence of these ores in Cape Breton was recorded only by the mineralogist. Recently, however, deposits of economic value have been found and worked. The ores of manganese occur, in Nova Scotia proper, in strata of Lower Carboniferous age, occupying a horizon low down in the Marine Limestone formation. The late Dr. How, in a paper read before this Institute some years ago, gave an interesting account of these minerals as they occur and are worked in Hants County. This evening I purpose merely to draw the attention of the Institute to their occurrence in Cape Breton, an interesting fact, as the knowledge of their presence in workable amounts in the Loch Lomond district will lead to a search for them in other parts of the Island. In all probability, the wide extent of the Cape Breton Limestones will before long afford several localities containing deposits worthy of the miner's attention. My notes are from a visit to the mine, and from information kindly furnished me by Mr. Fletcher, of the Geological Survey of Canada, who made a detailed survey of this district summer before last. The geological features of this part of Cape Breton are represented by a band of millstone grit extending from Mira River,

up the Salmon River, to Loch Lomond; and bounded on the north by the felsites of East Bay, and on the south by the felsites of the Mira Hills. At several points the Lower Carboniferous marine limestone formation crops out beneath the millstone grit, and occurs as isolated patches resting directly on the felsites, and there are patches of the basal carboniferous conglomerates brought up by faults through the millstone grit.

The locality in which these deposits have been discovered is on the Salmon River Road, about two miles east of Loch Lomond, near the line dividing Cape Breton and Richmond Counties.

The felsites formed a shore along which we now find limestones, conglomerates, shales and grits exposed as they were accumulated under the varying conditions of current, depth of water, and of the prevailing winds of the period under consideration. At some points the limestones rest on the felsites, at other points conglomerates and shales intervene. The discoveries of manganese ores, more particularly the subject of my paper, were made in one of these bays, where the felsites are succeeded by shales, grits, conglomerates, and finally by limestones, the latter extending apparently from point to point of the ancient Bay.

The manganese ores are found at the Western, or McCuish Mine, in irregular bedded layers in a soft arenaceous shale, which is in places calcareous, and coated with manganese oxide. The layers vary in thickness up to 18 inches, and are sometimes connected by vertical stringers of ore. The shales when weathered present nodules of ore, and large quantities are present as films on the cleavage planes of the shale.

At the Eastern, or Morrison mine, the ore at the time of my visit was mined from a bed underlying a thin layer of black manganiferous limestone, with red and greenish shales and sandstones and conglomerate. The thickness of the ore and of the limestone varied from 2 to 8 inches. The average thickness of the two layers being 8 inches.

The ore was found at several other points in the vicinity as lenticular masses and irregular nests in conglomerate, etc., and

sometimes of occurrence in the low island near Lomond point under conditions.

The limestones are porous and friable, which sometimes may be silvered.

The ore is pyrolusite, generally a fine structure. It is apparently of lenticular form. The mineral is limonite.

The following are Geological Survey samples.

Sample No. 1

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Sample No. 2

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Ores represent uses to which they are put in making.

As the quality of the ore is permanent, the close of the season.

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sometimes forming the cementing material. This latter mode of occurrence is similar to that shown by the red hematites found in the lower carboniferous conglomerates at several parts of the island near their junction with older strata. And near the Loch Lomond post office a highly manganiferous red hematite occurs under conditions apparently of a similar nature.

The limestone overlying these measures is highly manganiferous and ferriferous, and contains numerous crystals of galena, which some time ago incited prospecting, as they were thought to be silver ore.

The ore from the Western, or McCuish mine, is a fine-grained pyrolusite, sometimes holding a little brown, or hard ore. It is generally amorphous, but the better grades show a subcrystalline structure. The McCuish ore is a soft black amorphous ore, apparently of high order. At several points considerable masses of lenticular hard ore are met, with calcspar and heavy spar. The minerals associated with the ore are calcite, baryte and limonite.

The following analyses by Mr. G. C. Hoffman, Analyst to the Geological Survey, will show the character of the ores:—

Sample No. 1.—Pyrolusite with a little manganite, gave—

Binoxide.....81·52 per cent.

Sample No. 2, consisting almost exclusively of pyrolusite, gave

Binoxide.....88·98 per cent.

Ferric oxide 21 “ “

Ores represented by the above analyses would be adapted for all uses to which the mineral is usually put, and especially to glass making.

As the extent of manganiferous ground is considerable, and the quality good, it is to be hoped that these ores will form a permanent addition to the list of Cape Breton exports. Up to the close of the year 1883 about 200 tons have been shipped.

These ores have been worked by Mr. E. T. Moseley, who deserves credit for having inaugurated a new mining industry in Cape Breton County.